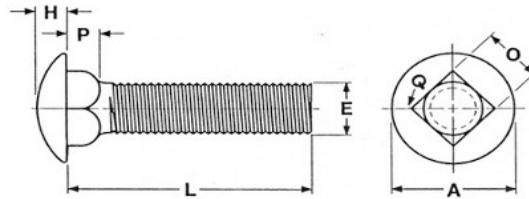


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Carriage Bolts

1.0 Dimensions: ASME B18.5



Nominal Size or Basic Product Diameter E	A		H		O		P		Q
	Head Diameter		Head Height		Square Width		Square Depth		Corner Radius On Square
	Max	Min	Max	Min	Max	Min	Max	Min	Max
# 10	0.469	0.436	0.114	0.094	0.199	0.185	0.125	0.094	0.031
1/4	0.594	0.563	0.145	0.125	0.260	0.245	0.156	0.125	0.031
5/16	0.719	0.688	0.176	0.156	0.324	0.307	0.187	0.156	0.031
3/8	0.844	0.782	0.208	0.188	0.388	0.368	0.219	0.188	0.047
7/16	0.969	0.907	0.239	0.219	0.452	0.431	0.250	0.219	0.047
1/2	1.094	1.032	0.270	0.250	0.515	0.492	0.281	0.250	0.047
5/8	1.344	1.219	0.344	0.313	0.642	0.616	0.344	0.313	0.078
3/4	1.594	1.469	0.406	0.375	0.768	0.741	0.406	0.375	0.078
7/8	1.844	1.719	0.459	0.438	0.895	0.865	0.469	0.438	0.094
1	2.094	1.969	0.531	0.500	1.022	0.990	0.531	0.500	0.094

Notes :

- Thread Class of Fit : Plain : 2A. Zinc Plated : 2A before zinc plating and after zinc plating must meet 3A GO & 2A NO GO thread ring gage condition. Hot Dip Galvanized : 2A before coating.
- The minimum thread length specified for carriage bolts is equal to twice the basic bolt diameter plus 0.25 inch for nominal bolt length of 6 inch or shorter and twice the basic bolt diameter plus 0.50 inch for longer nominal lengths.
- The standard specifies only minimum thread length for carriage bolts. They are supplied as fully threaded only. In the case of very long screws, they may be supplied with thread length of only 6 inches.



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Carriage Bolts

2.0 Mechanical Properties (For Full Size Bolt Testing):

2.1 Steel: ASTM A307 Grade A

Grade	Length	Hardness	Tensile Strength Minimum	Grade Marking
A	Less than 3 times the diameter	69 to 100 HRB	60,000 PSI	307A
	3 times the diameter and longer	100 HRB Max		

Notes: The screws will also have manufacturer's marking on the head in addition to the grade marking as mentioned in the table.

2.2 Steel: SAE J429 Grade 5

Classification		Rockwell Hardness	Proof Load Strength Minimum	Tensile Strength Minimum	Grade Marking
Grade	Nominal Size				
5	1/4 thru 1	C25 to C34	85,000 PSI	120,000 PSI	3 Radial Lines 120 degrees apart

Notes: The screws will also have manufacturer's marking on the head in addition to the grade marking as mentioned in the table.

2.3 Stainless Steel : ASTM F593

(1KSI = 1000 PSI)

Classification		Condition	Tensile Strength KSI	Yield Strength KSI	Rockwell Hardness
Type	Nominal Size				
304 (18-8) & 316	1/4 to 5/8 incl	CW1	100 to 150	65	B95 to C32
	3/4 to 1 - 1/2 incl	CW2	85 to 140	45	B80 to C32



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Carriage Bolts

3.0 Surface Finish: Plain/Zinc/HDG. Zinc & HDG details given in table below:

Properties	Zinc Clear	Zinc Yellow	Hot Dip Galvanized (HDG)
Type	Trivalent (Cr+3)	Hexavalent (Cr+6)	RoHS Compliant
Color	Clear	Yellow	
Minimum Coating Thickness	0.0001"/3 Microns or 0.0002"/5 Microns	0.0001"/3 Microns or 0.0002"/5 Microns	Coating thickness for sizes 3/8 " & under : 0.0017" (43 microns) and for sizes over 3/8 " : 0.0020" (50 microns)
Specification	ASTM F1941/F1941M Fe/Zn 3AN or Fe/Zn 5AN	ASTM F1941/F1941M Fe/Zn 3C or Fe/Zn 5C	ASTM F2329/F2329M or ASTM A153/A153M